

H. KIEREN,
BLOW-OFF VALVE.
APPLICATION FILED JULY 21, 1908.

913,644.

Patented Feb. 23, 1909.

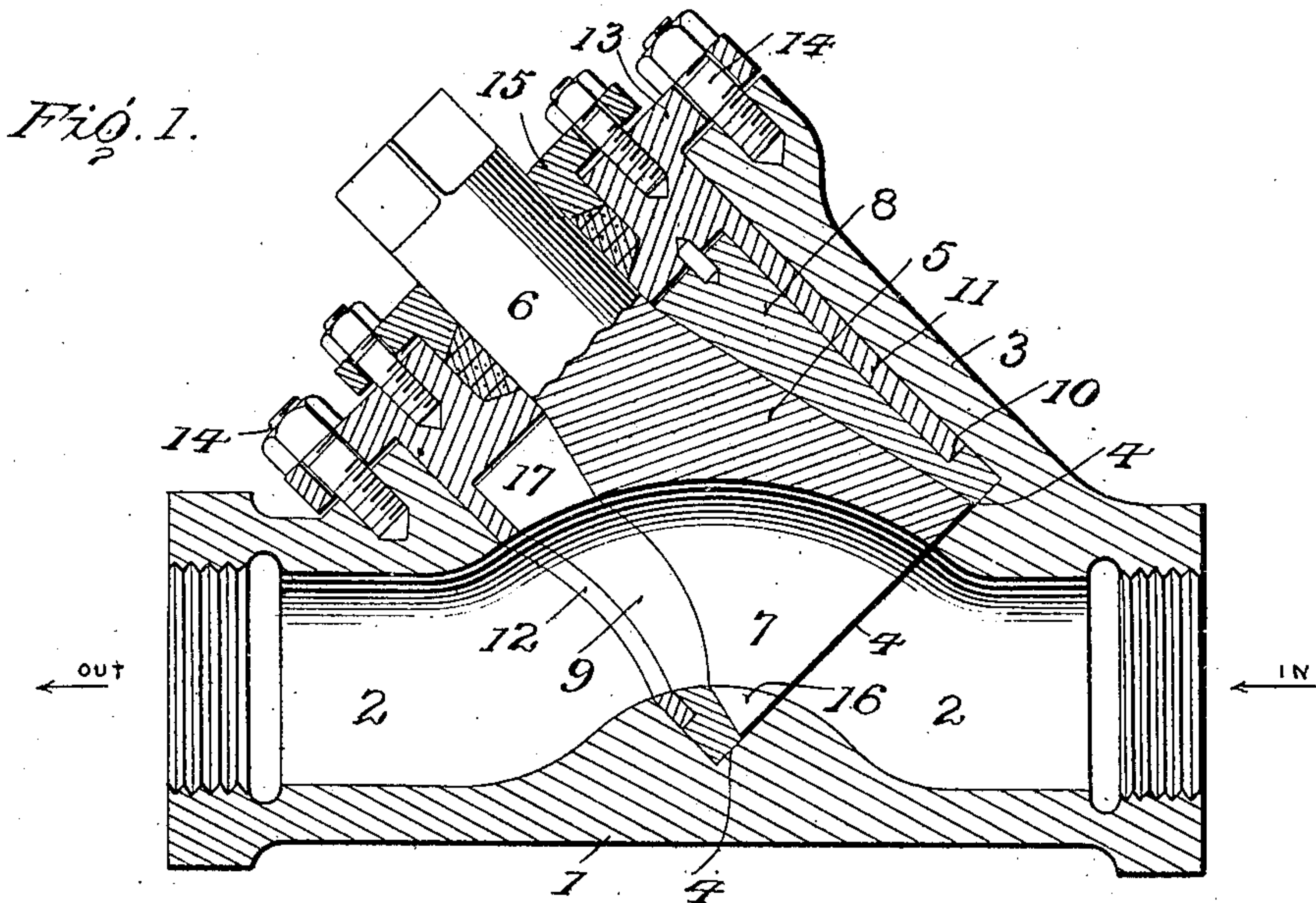


Fig. 2.

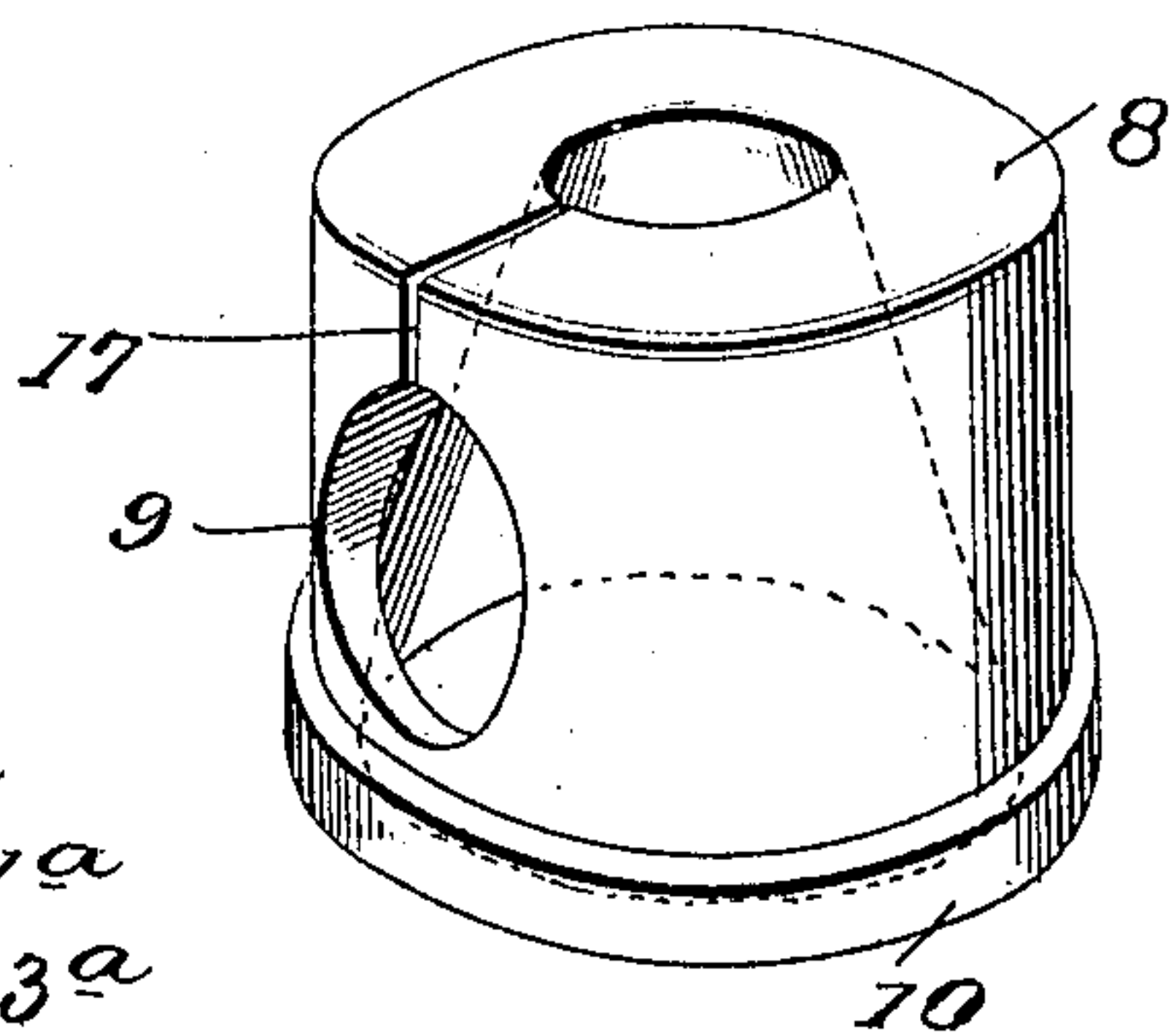


Fig. 3.

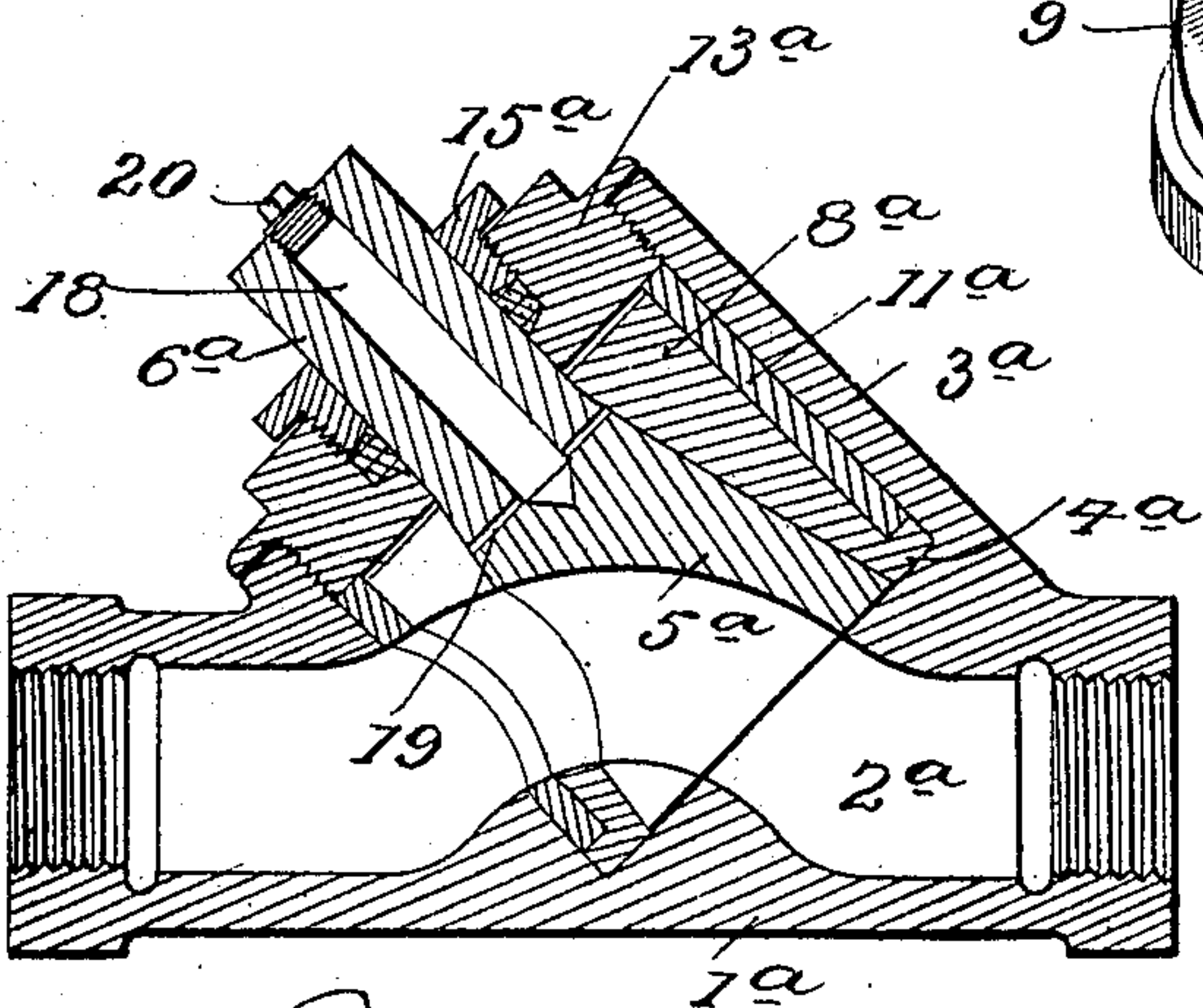
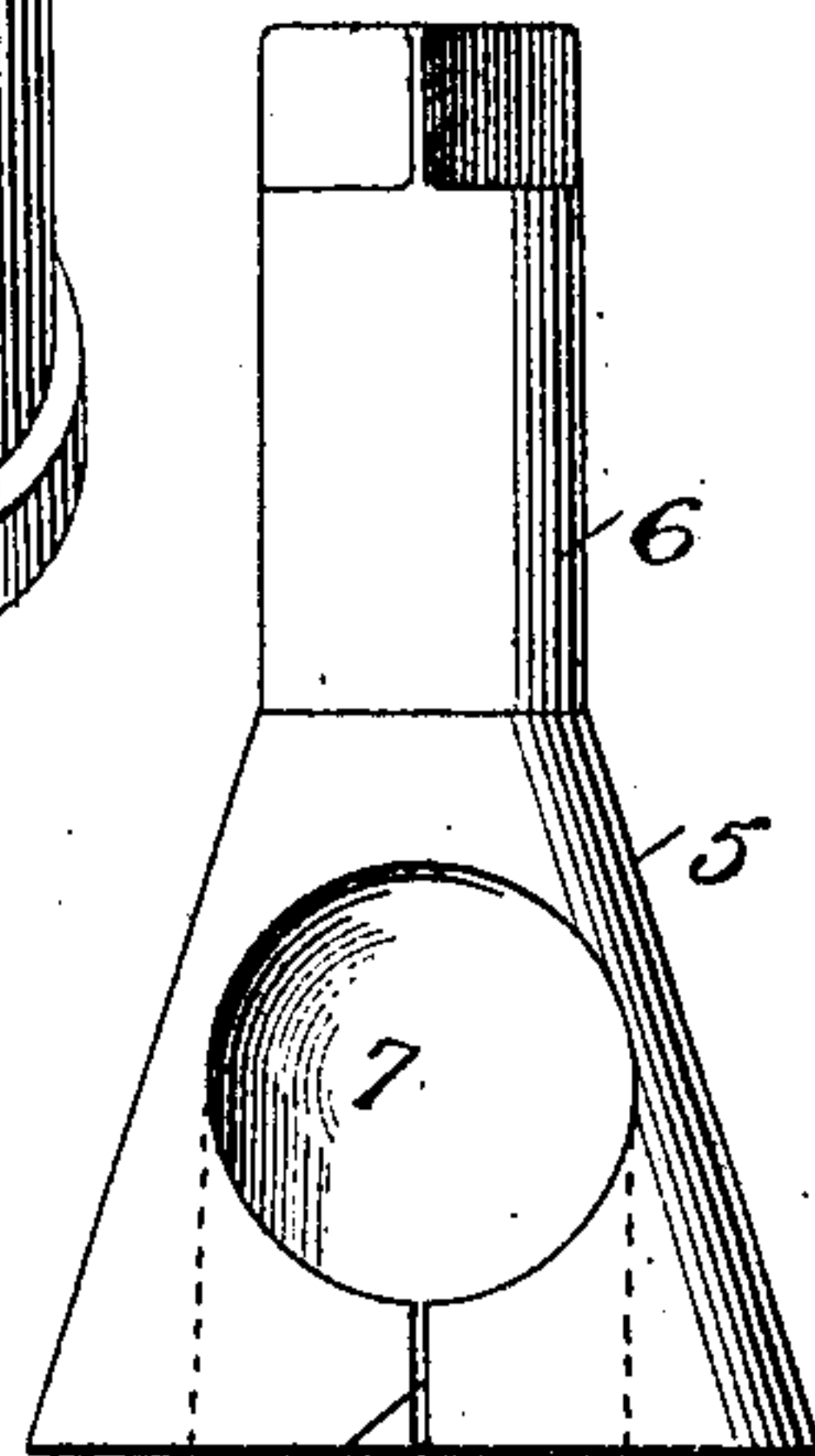


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY KIEREN, OF CRYSTAL FALLS, MICHIGAN, ASSIGNOR OF ONE-HALF TO FRED H. MILLER, OF CRYSTAL FALLS, MICHIGAN.

BLOW-OFF VALVE.

No. 913,644.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed July 21, 1908. Serial No. 444,623.

To all whom it may concern:

Be it known that I, HENRY KIEREN, citizen of the United States, residing at Crystal Falls, in the county of Iron and State of Michigan, have invented certain new and useful Improvements in Blow-Off Valves, of which the following is a specification.

This invention relates to blow-off valves for use in connection with steam boilers.

As is well known, the scale and sediment which are deposited in the lower portion of steam boilers by the precipitation of the solid impurities in the water effected by the production of steam is blown out with the water in the lower portion of the boiler, at predetermined intervals, by the pressure of steam in the upper portion of the boiler because such scale or sedimentary accumulations if not then blown out would settle and harden and by preventing the cooling effect of the water in the circulation thereof would cause the lower sheets of the boiler to be burned out. Obviously then, the seatings in ordinary blow-off valves employing this line of escape for the hot water, are brought into contact with the hard and flinty substance in the water so that when the plug is opened or closed these flinty particles are ground in between these seatings and, in a short time, destroy the perfect fit necessary to prevent leakage.

In order to at all times maintain a perfect fit of the plug of the blow-off valve and at the same time to permit of a slight easing up of the plug to avoid a pinch or grinding seat, and at the same time lessen the wear, and any tendency to stick, are the primary objects of my invention. And a further object of this invention is an improved construction of blow-off valve which embodies the characteristic of simplicity that is incident to the ordinary plug valve, and that is so constructed that it will not stick or hang up under any pressure nor with any degree of heat that can be applied to it in use commercially.

With these and other objects in view as will more fully appear as the description proceeds the invention consists in certain constructions, arrangements and combinations of the parts that I will hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following de-

scription and accompanying drawings in which:

Figure 1 is a longitudinal sectional view of a blow-off valve illustrating my invention embodied in the straight-way type of valve. Fig. 2 is a detail perspective view of the renewable valve seating employed; Fig. 3 is a detail view of the plug; and, Fig. 4 is a longitudinal sectional view illustrating modifications hereinafter specifically referred to.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to the drawing, the numeral 1 designates the body of the valve which is composed of a one piece structure arranged at its ends for screw threaded or other coupling engagement with the line of pipe in which it is to be introduced and which is provided with a reversely curved passage 2 extending longitudinally therethrough and of subsequently uniform diameter throughout and highest at the middle of the body. The body 1 is formed with a boss 3 set at an inclination to the longitudinal axis of the body, the body being formed on the interior of the boss and at right angles to the interior wall thereof with an annular shoulder 4 which encompasses the passage 2 and which extends into the thickened portion of the body formed at the middle thereof by the curved character of the passage. The valve proper, or plug 5, is tapered from its lower end toward its upper end where it is provided with a smooth cylindrical stem 6, and a projecting polygonal shank for engagement by a suitable tool to turn the plug. The plug 5 is formed with a passage 7 extending therethrough, the inlet end of the passage extending from the bottom of the plug as shown while the outlet end extends through the side of the plug and makes said passage through the plug diagonal to the axis thereof.

8 designates a renewable shell and seating for the plug, said shell being substantially cylindrical on its exterior and being formed with an opening conforming to the tapered body portion of the plug which it surrounds, as best seen in Fig. 1. The seating 8 is formed with an outlet port 9 registering with the passage 2 through the body portion of the valve and designed for registry with the

outlet end of the passage 7 through the plug, when the latter is turned to open the valve. The renewable shell or seating 8 rests upon the annular shoulder 4 and is itself formed with an outwardly facing annular shoulder 10 against which snugly fits a sleeve 11 that in the embodiment of the invention illustrated in Fig. 1 forms an integral part of the cap 13 and that snugly encircles the seating 8. The sleeve 11 is formed with a port 12 coinciding with the outlet port 9 of the seating. The cap 13 may be secured to the body 1 by means of stud bolts 14, and the stuffing box 15 which surrounds the stem 6 of the plug may be secured to the cap by corresponding bolts.

It is to be particularly noted that the bottom of the body portion of the plug 5 is split as indicated at 16, the split or slit extending entirely through from the passage 7 of the plug to the exterior thereof and from the bottom of the plug to the outlet end of said passage. It is also to be especially noted that the top portion of the renewable seating 8 is correspondingly split as indicated at 17, the slit or split thus formed extending from the upper edge of the seat to the outlet port 9 thereof, and from the interior wall or opening through the seat to the exterior of the wall. This spring character of the seating 8 allows for a slight expansion in the upper part of the plug caused by the passage of heated steam or water through the valve and the slitted bottom portion of the plug itself permits the necessary expansion at the bottom of the valve. Obviously neither one of these two parts could embody both of these features and yet produce a practical construction, but the combination of the two affords a valve construction which upon a sudden or material increase in the heat or pressure, will ease up sufficiently at both the bottom and the top of the plug to avoid a pinch or grinding seat and, at the same time, lessen the wear and any tendency to stick.

In that form of the invention illustrated in Fig. 1, it will be seen that I have provided a combined sleeve and cap that not only holds the spring seating 8 in place, but also makes a top for the valve. By constructing the renewable seating 8 as a distinct member from the sleeve 11 and its cap an economy is effected because the cap may be made of iron, while the renewable seating should properly be composed of brass.

In that form of the invention illustrated in Fig. 4, I have modified the construction to some extent, such form of valve being particularly designed for the smaller sizes, although manifestly not limited to such application. Referring to that view of the drawing, 1^a designates the body portion formed with the reversely curved passage 2^a the boss 3^a, and shoulder 4^a; 5^a designates the tapered plug, the body portion of which is similar

to the plug 5, and 8^a designates the renewable seating above described. And 11^a designates the sleeve which encircles the renewable seating and which is designed to hold it to its place, and in this instance said sleeve is formed as a separate element from its cap 13^a, said cap being screwed into the outer end of the boss 3^a bearing against the outer edge of the sleeve. And the stuffing box 15^a is similarly screwed into an internally threaded boss formed on the cap 13^a. This view (Fig. 4) also shows that, if desired, I may form the stem 6^a of the plug with a longitudinally extending and centrally disposed bore 18 constituting a chamber for lubricants, said chamber communicating at its inner end with one or more outlet passages 19, so that the oil or the like may pass outwardly to lubricate the plug. 20 designates a screwplug to close the outer end of the oil chamber.

From the foregoing description in connection with the accompanying drawings, it will be seen that I have provided a very simple, and efficient construction of blow-off valve which may manifestly be embodied in the angle or straight way types by merely changing the inclination of the interior parts with respect to the passage through the body of the valve, and which will in operation at all times prevent leakage of the valve and prevent any part from becoming incrustated with scale or other sediment to the detrimental working of the valve, while at the same time, by the combination of the spring seating and spring plug, will permit the valve to ease up at both the bottom and the top of the plug upon a sudden increase in heat or pressure so as to avoid any pinching or grinding seat with their accompanying tendencies to stick and liability to wear.

Having thus described the invention, what is claimed as new is:

1. A blow-off valve for steam boilers, comprising a body formed with a passage extending therethrough, and an annular shoulder encompassing said passage, a plug mounted to turn in the body portion and formed with a passage designed to control the passage through the body and a renewable seating encircling the plug and resting upon said annular shoulder, and means for holding said seating in place, the seating being formed with a port designed to register with the passage in the plug and being split from the plug to the outer periphery of the seating, and from the port therein to the top or outermost wall thereof.

2. A blow-off valve for steam boilers, comprising a body formed with a passage extending therethrough, and an annular shoulder encompassing said passage, a tapered plug mounted in said body and formed with a passage designed to control the passage through the body, a renewable seating in

which said plug fits, said seating being designed to rest on said shoulder and being formed with a port designed to register with the passage through the plug, the plug being split at its bottom from the passage outwardly and the seating being correspondingly split from its port upwardly and inwardly to the plug, and means for holding said seating in place.

10 3. A blow-off valve, consisting of a body formed with a passage extending there-
through, a tapered plug mounted in said body
and formed with a passage designed to con-
15 trol the passage through the body, a renew-
able seating in which said plug fits, said seat-
ing being mounted within the body and being
formed with an outwardly facing annular
shoulder, a sleeve encircling said seating and
engaging said shoulder to hold the seating in
20 place, the seating and sleeve being formed
with ports registering with the passage in the
body, and means for holding said sleeve
pressed against the shoulder of the seating.

25 4. A blow-off valve consisting of a body
portion formed with a passage extending
therethrough, a tapered plug mounted in said
body and formed with a passage controlling

the passage in the body, a renewable seating
in which said plug fits, said seating being
mounted in the body, and a combined cap 30
and sleeve fitting within the body and the cap
being secured to the body, the renewable
seating being formed with an outwardly fac-
ing annular shoulder against which the inner
edge of the sleeve abuts. 35

5. In a valve of the character described,
the combination of a body having a passage
extending therethrough, a plug mounted in
said body and formed with a passage con-
trolling the passage in the body, and means 40
for holding said plug in place, said means in-
cluding a seating in which the plug fits, the
seating being formed with an outlet port, and
being split from its interior to its exterior and
from its outlet port to its outer end, and the 45
plug being split from its bottom to the out-
ward end of its passage as and for the pur-
pose set forth.

In testimony whereof I affix my signature
in presence of two witnesses.

HENRY KIEREN. [L. s.]

Witnesses:

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